2982/LDCE/CM/2025/Gr.'B' (GB), **दिनांक: 21-01-2025**

विषय:चार्जमैन (तकनीकी/गैर-तकनीकी) के पद पर पदोन्नति के लिए सीमित विभागीय प्रतियोगी परीक्षा (LDCE) आयोजित करने की योजना के संबंध में।

चार्जमैन (तकनीकी) और चार्जमैन/गैर-तकनीकी (OTS और स्टोर्स) के लिए वर्ष 2023 और उसके बाद की रिक्तियों के लिए सीमित विभागीय प्रतियोगी परीक्षा (LDCE) आयोजित करने की तैयारी SRO-13(E) 1989, SRO-191 1994, और SRO-66 2003 के प्रावधानों के अनुसार की जाएगी।

इसके अलावा, रक्षा उत्पादन विभाग के 24-09-2021 के आदेश के अनुसार, पूर्ववर्ती आयुध निर्माणी बोर्ड (OFB) को 01-10-2021 से कॉर्पोरेट में परिवर्तित कर दिया गया और इसे 7 नए रक्षा सार्वजनिक क्षेत्र उपक्रमों (DPSUs) में विभाजित कर दिया गया। इन नए DPSUs ने अब अपने मुख्य कार्यात्मक क्षेत्र के आधार पर अपने स्वयं के व्यवसाय मॉडल और उत्पादन योजना तैयार कर ली है।

कॉर्पोरेटाइजेशन के बाद की इस नई स्थिति को ध्यान में रखते हुए, चार्जमैन (तकनीकी/गैर-तकनीकी) श्रेणी के लिए LDCE आयोजित करने की योजना का पुनरीक्षण किया गया है। यह निर्णय लिया गया है कि वर्ष 2023 और उसके बाद की रिक्तियों के लिए चार्जमैन (तकनीकी) और गैर-तकनीकी (OTS और स्टोर्स) के आगामी LDCE के लिए निम्नलिखित योजना अपनाई जाएगी:

प्रत्येक ट्रेड/डिसिप्लिन के चार्जमैन/तकनीकी और गैर-तकनीकी (OTS और स्टोर्स) के लिए एकल प्रश्न पत्र होगा, जिसमें 100 प्रश्न होंगे। यह प्रश्न पत्र दो भागों (भाग-I और भाग-II) में विभाजित होगा। विवरण नीचे संलग्न है:

पद का नाम:	**ट्रेड/डिसिप्लिन:**	**परीक्षा का स्तर और शैक्षणिक योग्यता** (उपरोक्त SROs के प्रावधानों के अनुसार)	**प्रश्न विषय/प्रश्न संख्या (कुल प्रश्न-100)** (प्रत्येक प्रश्न के लिए 2 अंक, कुल अंक 200) (प्रत्येक गलत उत्तर के लिए 0.5 अंक की नकारात्मक अंकन का प्रावधान होगा)

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चार्जमैन (तकनीकी)	यांत्रिकी (Mechanical) विद्युत (Electrical) सिविल (Civil) इलेक्ट्रॉनिक्स (Electronics) ऑटोमोबाइल (Automobile)	AICTE द्वारा मान्यता प्राप्त संबंधित क्षेत्र में तीन वर्षीय डिप्लोमा या समकक्ष योग्यता प्रमाणपत्र अनिवार्य।	**प्रश्न विभाजन:** **भाग-I:**सामान्य इंजीनियरिंग (25 प्रश्न) संबंधित डिसिप्लिन का तकनीकी विषय (50 प्रश्न) **भाग-II:**सामान्य ज्ञान और सामयिकी (25 प्रश्न)
	यांत्रिकी (आईटी) (Mechanical - IT)	भारत सरकार द्वारा मान्यता प्राप्त कंप्यूटर विज्ञान में 'ए' लेवल दक्षता प्रमाणपत्र पाठ्यक्रम या समकक्ष योग्यता।	
	रसायनिक (Chemical) धातुकर्म (Metallurgical) वस्त्र प्रौद्योगिकी (Clothing Technology) चमड़ा प्रौद्योगिकी (Leather Technology)	सामान्य रसायन विज्ञान (General Chemistry) मुख्य विषयों में से एक के रूप में बी.एससी. डिग्री। (या) AICTE द्वारा मान्यता प्राप्त संबंधित क्षेत्र में तीन वर्षीय डिप्लोमा या समकक्ष परीक्षा/योग्यता।	
चार्जमैन (गैर-तकनीकी) - स्टोर		मान्यता प्राप्त विश्वविद्यालय से इंजीनियरिंग, तकनीकी, मानविकी, विज्ञान, वाणिज्य, कानून आदि में स्नातक डिग्री।	**भाग-I:**स्टोर प्रक्रिया और सामग्री प्रबंधन (75 प्रश्न) **भाग-II:**सामान्य ज्ञान और सामयिकी (25 प्रश्न)
गैर-तकनीकी (स्टोर)	चार्जमैन (गैर-तकनीकी) - अन्य स्टोर से भिन्न		**भाग-I:**कार्यालय प्रक्रिया और प्रशासन (75 प्रश्न) **भाग-II:**सामान्य ज्ञान और सामयिकी (25 प्रश्न)

नोट-1:परीक्षा की अवधि तीन (03) घंटे की होगी।

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BOOKS FOR LDCE JWM AS PER SYLLABUS

(***HINDI AND ENGLISH BOOKS ARE NOT TRANSLATION OF SAME BOOK, BOOKS ARE PREPARED BY DISTINCT PERSONS)***

1. General Engineering for JWM (Part-II) (हिंदी)(Common for all candidates)**-- (413 PAGES)**
2. General Engineering **(ENGLISH)- (593 PAGES)**
3. **MCQ General** Engineering for JWM (Part-II) (Common for all candidates) - **UNDER PREPARATION**
4. GENERAL KNOWLEDGE, CURRENT AFFAIRS & ORGANIZATIONAL AWARENESS (Part-III) (Common for all candidates) (हिंदी)- **(295 PAGES)**
5. GENERAL KNOWLEDGE **(ENGLISH)- UNDER PREPARATION**
6. **MCQ GENERAL** KNOWLEDGE, CURRENT AFFAIRS & ORGANIZATIONAL AWARENESS (Part-III) (Common for all candidates**)-UNDER PREPARATION**
7. MECHANICAL ENGINEERING **PT-1**-**READY** (हिंदी)- (416 PAGES
8. MECHANICAL ENGINEERING **PT-2**(हिंदी)- (
9. MECHANICAL ENGINEERING **(ENGLISH)- UNDER PREPARATION**
10. **MCQ** MECHANICAL ENGINEERING**-UNDER PREPARATION**
11. CHEMICAL ENGINEERING **PT-1** (EXPLOSIVE TECH + SAFETY) (हिंदी)- (228 PAGES
12. CHEMICAL ENGINEERING **PT-2**-**READY** (हिंदी)- (494 PAGES
13. **MCQ**CHEMICAL ENGINEERING**-UNDER PREPARATION**
14. CLOTHING TECHNOLGY(हिंदी)- (166 PAGES
15. **MCQ**CLOTHING TECHNOLGY**-UNDER PREPARATION**
16. METALLURGICAL ENGINEERING (हिंदी)- (229 PAGES
17. **MCQ**METALLURGICAL ENGINEERING**-UNDER PREPARATION**
18. ELECTRICAL ENGINEERING & ELECTRONICS (हिंदी)- (**-UNDER PREPARATION**
19. **MCQ** ELECTRICAL ENGINEERING & ELECTRONICS**-UNDER PREPARATION**
20. CIVIL ENGINEERING (हिंदी)- (**-UNDER PREPARATION**
21. **MCQ**CIVIL ENGINEERING**-UNDER PREPARATION**
22. QUESTION PAPERS 14, 15, 16, 17, 18, 20, 22 -**READY**
23. **50 Practice set of 50 questions and answer (Hindi & English)on whats app**

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BOOKS FOR LDCE CHARGEMAN AS PER SYLLABUS

(HINDI AND ENGLISH BOOKS ARE NOT TRANSLATION OF SAME BOOK, BOOKS ARE PREPARED BY DISTINCT PERSONS)

1. General Engineering (हिंदी) PT-1 ***(410 पेज)***
2. General Engineering (हिंदी) –PT-2 ***(410 पेज)***
3. MCQ General Engineering**-UNDER PREPARATION**
4. ***सामान्य अध्ययन (GK)*** (हिंदी) ***-324 पेज***
5. **General knowledge (English) –**
6. MCQ ***सामान्य अध्ययन (GK)*** -UNDER PREPARATION
7. ***ऑफिस प्रोसीजर***(हिंदी) ***-244पेज***
8. **OFFICE PROCEDURE (ENGLISH)-READY**
9. MCQ ***ऑफिस प्रोसीजर*****-UNDER PREPARATION**
10. ***ऑफिस एड्मिनिस्ट्रेशन***(हिंदी) **– *(384 पेज)***
11. **Office administration (English) –*(319 पेज)***
12. MCQ ***ऑफिस एड्मिनिस्ट्रेशन*****-UNDER PREPARATION**
13. ***मटेरियल मैंनेजमेंट***(हिंदी) ***197 पेज***
14. **Material management (English) –**
15. MCQ ***मटेरियल मैंनेजमेंट*** **-UNDER PREPARATION**
16. ***स्टोर प्रोसीजर***(हिंदी) **- *267 पेज***
17. **Store procedure (English) –**
18. MCQ ***स्टोर प्रोसीजर*****-UNDER PREPARATION**
19. MECHANICAL ENGINEERING PT-I(हिंदी)
20. MECHANICAL ENGINEERING PT-I **(English) –**
21. MECHANICAL ENGINEERING PT-II(हिंदी)
22. MECHANICAL ENGINEERING PT-II
23. MCQ MECHANICAL ENGINEERING**-UNDER PREPARATION**
24. MECHANICAL ENGINEERING (IT) (हिंदी) **-UNDER PREPARATION**
25. MCQ MECHANICAL ENGINEERING (IT) **-UNDER PREPARATION**

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26. CHEMICAL ENGINEERING-(हिंदी)

27. CHEMICAL ENGINEERING(ENGLISH)

28. MCQ CHEMICAL ENGINEERING-**UNDER PREPARATION**

29. MATTALARGICAL ENGINEERING(हिंदी) – ***(207 पेज)***

30. MATTALARGICAL ENGINEERING**(English) –**

31. CLOTHING TECHNOLOGY(हिंदी) – ***(259 पेज)***

32. CLOTHING TECHNOLOGY**(English) –**

33. MCQ CLOTHING TECHNOLOGY-**UNDER PREPARATION**

34. प्रश्न पत्र- पिछले 14 वर्षों के 2001 से 2020

35. **50 Practice set of 50 questions and answer (Hindi & English)on whats app**

केमिकल टेक्नोलॉजी के लिये Unit operation, heat transfer, mass transfer, fluid flow के अंग्रेजी में मटेरियल उपलब्ध है |

हिंदी में AOCP TRADE की बुक उपलब्ध है|

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REVISED SYLLABUS FOR LDCECHARGEMAN-(TECH/NON-TECH)

SYLLABUS FOR OFFICE PROCEDURE & ADMINISTRATION

OFFICE PROCEDURES

• OFFICE ORGANISATION & FUNCTION

Meaning of Office, Purpose & Basic Functions, Office Organization Basics: Division of Work & Delegation, Organization Charts, Span of Management

• OFFICE LAYOUT & ENVIRONMENT

Office Layout Vs Space Management, Objectives and importance of Office Layout, Principles of Office Layout. Office Environment: Lighting. Ventilation, Safety Precautions, Cleanliness & Sanitation.

• RECORDS MANAGEMENT

Meaning, Purpose & Types of Records, Processing Records, Principles of Record Keeping; Filing: Essentials of a good filing system objectives, Centralised Vs Departmentalised Filing, Advantages & Disadvantages of Filing System. Alphabetical, Subject wise, Numerical, Vertical or Upright, Advantages and Limitation.

Indexing: Meaning, Objects; Type of Index; Weeding of Records, Record Retention Schedule.

ADMINISTRATION

• GENERAL ADMINISTRATION

Role and Duties of Supervisor, Motivation, Communication, Leadership, Grievance Handling Mechanism, Delegation, Authority and Responsibility.

RULES AND PROCEDURES

CCS (Conduct Rules), CCS (CCA) Rules: Types of Penalties, Enquiry Procedure, Appeal and Review, Classification of Employees, Recruitment Procedures, Reservation of SC/ST and OBC, Maintenance of Rosters, DPC Procedures,

Fixation of Pay: Scale of Pay, Annual Increment, Fixation of Pay on Promotion, Re- designation, Revision etc.

Leave Rules: LTC/TA/ DA Rules, GPF Rules, Entitlement and Procedures for Advances/ Withdrawals.

Terminal Benefits: Pension, Family Pension, Gratuity, Leave Encashment, Commutation of Pension, Rules and Entitlement.

LABOUR WELFARE AND INDUSTRIAL RELATIONS

Works Committee: Constitution, Role and Function, JCM Level: Constitution, Role & Functions. Right and Liabilities of Recognized Unions, Unfair Labour practices.

Factory Act 1948: Statutory measures for Welfare, Safety, Health and Working Hours, Powers of Inspectors of Factories, Duties of Occupier, Rights and Duties of Workmen,

The Employee's Compensation Act: Entitlement and eligibility for compensation, Concept of accident on duty, occupational diseases.

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SYLLABUS FOR STORE PROCEDURE AND MATERIAL MANAGEMENT

MATERIAL PLANNING

Description of material to be procured, codification, economic quantity for procurement, when to procure.

PROVISIONING PROCEDURE

Ordering Quantity and Lead Time, Sources of Supply, Make and Buy decision.

STORE MANAGEMENT-GENERAL

STORAGE OF HAZARDOUS AND DANGEROUS GOODS

STORES PRESERVATION

Types of Material and details of preservation and procedures.

SECURITY ASPECTS OF STORES MANAGEMENT

Internal checks, External checks, Safe custody of valuable stores.

IVENTORY CONTROL

Introduction, Basic Problems, Economic Order Quantity and Ordering System Provisioning, Stores and Inventory Control.

STOCK VERIFICATION

Various Procedures adopted.

MATERIAL HANDLING

Stores Layout, Handling Equipment, Safety in Handling Methods of Storage Compatible to material handling system, Handling of Chemicals Acids and Kerosene, Paints etc., Lubrication Oil etc., Feeds and other hazardous items.

DISPOSAL OF SURPLUS STORES, SCRAPS AND WASTE PRODUCTS

Purpose, categorization of items, review of surplus items, agencies for disposal.

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SYLLABUS FOR GENERAL KNOWLEDGE & CURRENT AFFAIRS

(Common for both Technical & Non-Technical Posts)

- **FIVE YEAR PLANS**
- **CONSTITUTION OF INDIA**
- **FACTORIES ACT**
- **THE EMPLOYEE'S COMPENSATION ACT**
- **PAYMENT OF WAGES ACT**
- **INDUSTRIAL DISPUTES ACT**
- **POPULATION EDUCATION & FAMILY PLANNING**
- **ENERGY CONSERVATION**
- **CURRENT AFFAIRS**
- **ENVIRONMENTAL AND POLUTION CONTROL**

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SYLLABUS FOR GENERAL PAPER IN ENGINEERING

UNITS

Introduction, Definition, Classification of Units.

GENERAL SIMPLIFICATIONS

Introduction, Fractions, Decimals, Divisions, and Multiplications of Fractions.

SQUARE ROOTS

Square and Square roots, Symbol of root, Method of finding out the Square roots.

GRAPH

Definition, Rules for drawing graph, Drawing and reading of simple graphs, Graph of simple equations and compound equations.

RATIO AND PROPORTION

Ratio, Proportion.

PERCENTAGE

ALGEBRA

Introduction, Addition and Subtraction, Multiplication and Division. Algebraic formulae, Proofs, Factorization, Equations.

MENSURATION

Introduction, Rectangle, Square, Parallelogram, Rhombus, Trapezium, Triangles, Hexagon, Circle, Sector, Segment of a Circle, Ellipse, Length of Belts, Area of irregular surfaces, Area of four walls, Finding out volume of solids, frustum of cone and pyramid.

TRIGONOMETRY

Definition, Trigonometrical formulae, Measurement of angles, Use of trigonometrical tables and logarithmic trigonometric tables. Trigonometric values of certain degrees, Area of triangle, line bar, Angle of elevation and depression, Taper turning Calculations, Solution of Triangles using Sine Rule and Cosine Rule.

METALS

Properties of metal, Types of metals, Difference between ferrous and non-ferrous metals, Ferrous metals, Classification of Iron, Pig Iron, Cast Iron, Wrought Iron, Steel. Types of Steel, difference between Cast Iron and Steel, Alloy Steel, Type of Alloy steel, Non-ferrous metals, Melting point and Weight. Non-ferrous Alloys.

HEAT TREATMENT

Function of heat treatment, Critical temperature, Annealing, Normalizing, Hardening. Tempering and Case Hardening.

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DENSITY AND RELATIVE DENSITY

Mass, Unit of mass, Weight, Difference between mass and weight of substance, Density, Unit of Density, Relative Density.

FORCE

Newton's laws of motion, Unit of force, To find out resultant force, Space and vector diagrams, Representation of force, Parallel forces, Couple, Parallelogram law of force, conditions of equilibrium, Kinds of equilibrium, some examples of equilibrium in daily life, Triangle of force, Converse of triangle of forces, Lami's theorem, Jib Crane.

MOMENT AND LEVER

Moments, Unit, Arm of Couple and Moment of Couple, Lever.

SIMPLE MACHINES

Simple Machines, Effort and Load, Mechanical Advantage, Velocity Ratio, Output and Input, Efficiency, Velocity Ratio and Mechanical Advantage, Pulley Block, Incline Plane, Simple Wheel and axle, Simple Screw Jack.

WORK POWER AND ENERGY

Work, Units of work, Power, Units of Power, Horse Power of Engines, Mechanical Efficiency, Energy. Uses of Energy, Potential and Kinetic Energy, Examples of Potential and Kinetic Energies. Transmission of power by a belt pulley drive.

FRICTION

Definition, Advantages and Disadvantages of Friction. Normal Reaction, Limiting friction, Laws of Limiting friction, Coefficient of friction, Angle of friction, Inclined plane, Force of friction, when the force is horizontal, Force of reaction when the force is inclined at an angle, with the horizontal.

SIMPLE STRESSES AND STRAINS

Introduction, Stress and Strain, Different types of stresses. Hooke's law, Young's modulus or Modulus of Elasticity. Yield point, Ultimate Stress and working stress, Factor of Safety, Stress-Strain Graph, modulus of Rigidity, Poisson's Ratio, Bulk modulus, Relationship between three modulus for a given material.

VELOCITY AND SPEED

Rest and motion, vector quantity, Scaler quantity, Speed, Velocity, Difference between velocity and speed, Acceleration, Equation of motion, Motion under the force of gravity.

HEAT

Heat, Unit of heat, Temperature, Difference between Heat and Temperature, Boiling point, Melting point, Scale of Temperature, Specific heat, Thermal capacity, Water equivalent of heat, Inter change of heat, Calorimeter, Latent heat of fusion, Latent heat of vapour, Transmission of heat, Thermos flask, Pyrometer, Thermocouple, Thermo electric Pyrometer, Coefficient of linear expansion, Indicated Thermal Efficiency, Brake Thermal Efficiency.

ELECTRICITY

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Introduction, Use of electricity, Molecule, Atom, Particles in Atom, How electricity is produced, Electric Current, Ammeter, Electromotive Force, Electric Voltage, Potential difference, Resistance, Conductor, Insulator, Switch, Fuse, Circuit, Ohm's law, Series and Parallel connections, Power, Horse Power, Energy, Unit of Electrical Energy.

PRESSURE

Atmosphere, Atmospheric pressure, Pressure, Unit, Pressure at a depth in a liquid, Absolute pressure, Gauge pressure, and vacuum pressure, How to measure pressures.

CENTRE OF GRAVITY

Introduction, Definition, Centroid, Methods of finding out Centre of gravity of figures, Centre of gravity of certain geometrical configurations, Centre of gravity Calculations.

THIN CYLINDRICAL SHELLS

Thin cylindrical shells, Assumptions, Circumstantial or Hoop Stresses, Longitudinal or Axial Stresses, Relationship between Stresses, Built up Cylindrical shells.

References

1. Work Shop Calculation & Science by Kapil Dev Asian Publishers, Delhi.

2. Basic Workshop Calculation and Science by R P Kumaer, R Dev, K C Narang New heights, Karol Bagh, New Delhi-110005

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SYLLABUS FOR MECHANICAL ENGINEERING

PROPERTIES AND TREATMENT OF IRON AND STEEL

Brittleness, Ductility, Elasticity, Hardness, Malleability, Plasticity, Toughness, Micro Structure of Steel, Effect of heating steel, Critical range. Heat treatment of steel, Furnace and furnace temperature, Pyrometers, Reasons of heat treatment, Annealing, Normalizing. Hardening and Tempering. Hot and Cold working, Case hardening, Workshop tests for iron and steel.

HEAT PROCESS, FORGING, RIVETTING, SOLDERING AND BRAZING

Hand Forging, Forge tools, Up Setting, Drawing down, Bending, Punching. Drifting. Welding. Power hammers and their tools, Riveting, Soldering, Brazing, Silver, Soldering, Adhesive banding.

POWER, SAFETY AND CARE

Safety in the shop, Mechanical and other accidents, Safety devices, Electrical accidents, Power, Various power driving systems, Bearings wear, Lubrication, Gravity, Force, Splash, Care and order in work shop.

METAL CUTTING

Metal cutting, Rake and clearance, Flat chisel, Saw, File, Drill, Grinding drills, Drilling hints, Turning, boring, shaping and planning tools, Effect of tool off Centre, Cutting rake and clearance for various metals, Cutting tools, Surface finish.

CHECKING AND MEASUREMENT OF SURFACES

Surface relationship and accuracy, Tests for accuracy, Flatness, Squareness, Parallelism. Roundness, Concentricity, Angle measurement, Vernier protector, Length measurement, The rule, Calipers, Micrometer, Vernier Caliper, Use of gauges.

LIMITS, FITS AND SURFACE QUALITY

Elements of inter changeable system, Fits, allowances, Clearances and interferences, Types of Fit, Hole basis and shaft basis, Geometric dimensions and Tolerances, Limit systems, Surface quality and surface finishes.

BENCH WORK AND FITTING

Equipment used, Various hand tools, hand operation viz. Chapping. Filing, Scrapping, Grinding. Sawing, Marking, Drilling. Reaming, Tapping, Dieing etc.

LATHE AND LATHE WORK

Parts of lathes, Types of lathes, Various turning operations, Lathe tools for various operations, Modern development in tool material and tooling technology, Face plate work, Taper turning. Taper gauges, Screw cutting. Determination of gears, Pitch and Lead, Cutting of thread, Locating tool, Marking lathe, Chasing dial, Internal threads, Tapping in the lathe, various turning attachments etc.

MILLING MACHINE AND MILLING OPERATIONS

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Parts of Milling Machine, Types of Milling Machines, Milling cutters, cutter material, Means of holding cutters, Work holding system and devices, indenting. Simple and differential indenting. Cutting speed and feed, Various Milling operations, Gears and Gear cutting.

GRINDING

Kinds of grinding machines, grinding operations, normal defects in cylindrical grinding and their remedies, grinding wheels, kinds of abrasive, grain size, bond, grade, structure, shape, dressing and truing, allowances for grinding, other factors.

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SYLLABUS FOR ELECTRICAL ENGINEERING

SAFETY PRECAUTIONS

Treatment of Shock, Mouth to nose method, how we get shock, Precautions to avoid electric shock, Graphical Symbols, Comparison of hand tools, Fuse and its type, Re-wireable, HRCfuse.

LAWS OF RESISTANCE, OHM'S LAW AND KIRCHHOFF'S LAWS

Electric Circuit, Sources of Electricity, Effect of Electric Current, Definitions of emf, P.D. Current, Resistance, Factors on which resistance depends; Specific resistance; Temperature Co-efficient: Ohm's Laws; Series and parallel circuit, Verifications of Ohm's Law; Kirchhoff's Laws.

POWER AND ENERGY

Power and Energy definition; Energy consumption; Horse Power, Pump and Efficiency, Heating effect of electric current; Joule's Laws.

MAGNETISM AND ELECTROMAGNETISM

Magnet and its properties, Comparison of Magnetic and Electric circuit; Diamagnetic, Paramagnetic, Ferro- magnetic material; Material used for permanent magnet; Solenoid, Toroid magnetic field; Electromagnet, Induced E.M.F. and Current; Faraday's Laws of Electromagnetic Induction; Fleming's Right hand rule; Lenz's Law; Ampere Rule; Cork screw Rule; End Rule, Helix Rule Self Inductance; Mutual Inductance; Eddy currents, Hysteresis loss.

CONDENSERS

Condenser, Capacity of condenser, Series connected condenser, Different types of condensers, Use of condenser in florescent tube.

CELLS AND BATTERIES

Electrolysis, Faraday's Law of Electrolysis; Electro-chemical Equivalent: Electroplating: Difference between P.D. and E.M.F., Denial Cell, Lec-lanche Cell, Dry Cell; Secondary cell Grouping of cells, series, parallel and mixed; Internal construction of Battery: Chemical action in Battery on charge and discharge; Parts of Secondary Cell; Charging of Battery, Capacity and efficiency of battery: Defects in battery. Sulphation, Backing of Plates, Sedimentation: Alkaline cells construction, Chemical changes, Characteristics, Comparison of lead acid and nickel alkaline cells.

D.C. GENERATORS

Main parts of D.C. machine, Slip ring and Commutator, Ordinary Generators, e.m.f. equation, Different types, D.C. Generators, Principle; Characteristic curves, Applications Armature reaction, Causes of sparking and method of reducing, Interpoles, Armature reactions, Commutation.

DC MOTORS

Principle, different types of DC motors, Shunt, Series, Compound wound, their applications, Starter, Connection and function of 3-point and four point starter series motor starters; speed control,defects in motors, motor Characteristics, losses.

HOUSE WIRING

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Wiring system; Type of wiring fuse; ISI, Rules, Megger testing. Earthing, House Wiring Estimating.

• AC CIRCUITS

Advantages of AC over DC and DC over AC Definitions, Cycle, Period, Amplitude, Instantaneous value, Average value, Form factor, Sine curve, Phase, In phase, Out of phase, Electrical degree, Inductance, Inductive Reactance, Capacitive Reactance, Impedance, RMS Value, Frequency, Vector addition, subtraction, lagging and leading of currents. AC Circuits, with resistance, inductance, capacitance in series variations of XC and XL with f. Power Factor, its effects, improvements, importance, parallel circuits, definition, Conductance, Susceptance, Admittance.

• POLYPHASE

2-phase, 3-phase, Advantages over single phase, Star and Delta connection, relation between line current and voltage with phase current and voltage, measurement of power with two wattmeter method, 3-phase 4-wire system of supply.

• TRANSFORMER

Construction, Types, Transformation Ratio, Transformer on no-load and load, Equivalent Circuit, Parts, Power Transformers, Conservator, Breather, Temperature gauge, Explosions vent, Pipes, Buchholz Relay: Efficiency, Cooling of Transformer, Auto Transformer, CT and PT: Connection of Wattmeter Energy meter through PT, and CT-Losses in Transformer, Parallel running, 3-phase Transformer, Scot Connection.

• A DESIGN OF SMALL POWER TRANSFORMER

ALTERNATORS

Rotating Field type, advantages; Parts; Relation between speed and frequency; Breadth factor; Coil span factor: EMF equation; parallel operation with synchroscope and with lamps; sharing of load; voltage regulators.

• AC THREE-MOTORS

Principle of action; Torque-Formulae, Types of Induction Motors, parts; Squirrel cage and Slip-ring Induction Motors; Double Cage Induction motor, Deep Bar Cage Induction motor, Synchronous speed and actual speed, Slip. D.O.L., Star Delta Starter, Auto transformer starter, Maintenance of A.C. Induction motors.

• SYNCHRONOUS MOTORS

Principle, Construction, operation, motor on load, motor on no load; Effect of Excitation on power factor, use of damper winding. Hunting effect; Auto synchronous motor: Synchronous motor without D.C. Excitation; Salient Pole synchronous motor, Defects in synchronous motor.

• AC SINGLE PHASE MOTORS

Principle and working: Types, split phase motor, Capacitor Start Induction run, Permanent Capacitor motor, capacitor start, Universal motor; Shaded pole motors,; Ceiling fan, Repulsion Induction motor; Principle & Characteristics, Electronic fan regulator.

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• WINDING

Winding terms; Types of winding; winding material; lap winding, wave winding; AC winding: Three phase winding, rules for connecting three-phase motors; Two-speed motors, Rewinding of motor.

• ELECTRICAL INSTRUMENTS

Introduction, Type, Deflection Type, Recording Type & Integrating Type; Symbols for meters; Moving Iron Instruments, Construction, working, properties, Repulsion type. Dynamometer type, working principle, properties; Connection of Voltmeter, Ammeter, Wattmeter; Induction type wattmeter, Megger, Earth tester; Energy meter, ISI Rules for Energy meters: PF meter; frequency meter; Three-phase wire, Three- phase four wire Energy meter, Post office box, Multi-meter, Special meters Digi-clamper Digital Tachometer, Electronic Insulation Tester.

• ILLUMINATION

Definitions and units, Incandescent lamps, Arc lamp; Sodium Vapor lamp: HPVM lamps, Fluorescent tube; use of choke and starter, Double tube circuit, Neon sign lamps.

ELECTRONICS

Cathode and Anode, Semi-conductor and transistors, input and output characteristics, Current gain, resistance gain, voltage gain, power gain in transistor, use of transistor as amplifier, as oscillator, Cathode ray tube, Vacuum tube voltmeter, Resistors, Capacitors, Color code of Capacitors, Inductors and Transformers.

Use of AC and DC method of Conversion; Motor generator set, Rotary Convertor, Rectifier construction and uses, metal rectifiers, mercury arc rectifier.

• GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRICITY

Generation types of Generating stations; Types of power stations; Transmission and Distribution overhead line system, underground cable system. PILCO Cables and Aluminum Cables, Sub-station, Type of poles, lightning arresters, I.E. Rules, Laying Cables.

ELECTRICAL APPLIANCES

Design for heating element, heater, Electric Bell, Buzzer, Emergency Light, Refrigerator, Room Cooler, Wiring.

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SYLLABUS FOR ELECTRONICS

Electronics Devices and Circuits:

1. Introduction

2. Semiconductor Physics

Intrinsic semiconductors-Conductivity, atomic and crystal structure of germanium and silicon, covalent bonds, generation and recombination, effect of temperature on conductivity of intrinsic semiconductors, energy levels diagram of conductor, insulators and intrinsic semiconductors, Extrinsic semiconductor materials Doping of impurity, P and n type semiconductors and their conductivity, minority and majority currents.

Semi-conductor Diode

P-N junction diode, mechanism of current flow in P-N junction, draft and diffusion current, depletion layer potential barrier, behavior of P-N junction characteristics, Zener and Avalanche breakdown, concept of junction capacitance in forward and reverse bias conditions Semiconductor diode characteristics, static and dynamic resistances and their calculation from diode characteristics, dynamic resistance of diode in terms of diode current Diode (P-N Junction) as rectifier half-wave rectifier, full wave rectifier including bridge rectifier, relationship between DC output voltage and AC input voltage, rectification efficiency and ripple factor for rectifier circuits power diodes, Zener diodes, Varactor diodes and point contact diodes.

4. Introduction to Bipolar Transistor

Concept of bipolar transistor as two junction three terminal device having two kinds of current carriers PNP and NPN transistor their symbols. CB, CE and CC configurations. Common base configuration (CB) input and output characteristics, determination of transistor parameters input and output dynamic resistance, current amplification factor, common emitter configuration: current relations in CE configuration, common collector configuration; comparison of CB and CC configuration with regards to dynamic input and output resistance current again and leakage current, preference of CE configuration over CB configuration, transistor as an amplifier in CE configuration.

5. Transistor Biasing and stabilization of Operating Point.

6. Single Stage Transistor amplifier

Single stage CE amplifier circuit with proper biasing components AC load line and its use. Expressions for voltage gain, input and output impedance for a single stage CE amplifier.

7. Field Effect Transistor (FET)

Construction operation, characteristics and equipment circuit of JFET and its circuit application

Construction, operation, characteristics and equipment circuit of MOSFET in depletion enhancement modes and its circuit applications. Comparison of JFET, MOSFET, BJT Simple FET amplifier circuit and its working principles (without analysis)

Digital Electronics

1. Introduction

Basic difference between analog and digital signal? Applications and advantages of analog signals

2. Number system.

Binary and hexadecimal number system, conversion from decimal and hexadecimal to binary and vice versa. BCO representation, Binary addition, subtraction, multiplication and division including binary points BC addition, 1's and 2's complement method of addition/subtraction.

3.3. Logic Gates

Concept of negative and positive logic, Definition, symbols and truth tables of NOT, AND, OR, NAND, EXOR Gates, NAND and NOR as universal gates, 4.

Logic Simplification.

Postulates of Boolean algebra, DE Morgan's Theorems, Various identities, Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equations with gates Karnaugh map (upto 4 variables) and simple applications in developing combinational logic circuits.

4. Logic Families

Logic Family Classification: Definition of SSI, MSI, LSI, VLSI, TTI and MOS families and their sub classification, Characteristics and TTL and MOS digital gates, delay, sped, noise margin, logic levels, power dissipation, fan-in, fan-out, power supply requirement and comparison between TTL and MOS families.

5. Arithmetic Circuits

Half adder and Full adder circuit, design and implementation? Half and full substracter circuit, design and implementation, 8 Decoders, Display Devices and Associated Circuits.

LED, LCD, Seven segment display, basic operation of various commonly used types four-bit decoder circuits for 7 segment display driver les.

• Multiplexers and De-Multiplexers

Basic Functions and block diagram of MUX and DEMUX, Different types 10 Latches and flip- flops concept and types of latch with their working and applications. Operation using waveforms and truth labels of RS. T. D. JK. Master/Slave JK flip flop, Difference between a latch and a flip-flop.

Counters

Binary counters, Divide by N ripple counters (including design) Decade counter bi-stable and programmable counters, Down counters, Updown counters, Synchronous counters (only Introduction) Difference between Asynchronous and Synchronous counters, Ring counter with timing diagram.

• Shift Register

Introduction and basic concepts including shift left and shift right, Serial in parallel out, serial in serial out, parallel in serial out, parallel in parallel out, universal shift register, buffer register. Tristate Buffer register.

Memories

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Basic RAM cell, N X M bit RAM, Expansion of word length and capacity static anddynamic RAM Basic idea of ROM, PROM AND EEPROM 13 A/D and D/A Convertors

General principle of A/D and D/A conversion and brief idea of their applications, Binary resister network and register ladder network methods of D/A conversion. Dual slope and successive approximation types of ADCs.

• Linear Application

Inverting amplifier, non-inverting amplifier, Voltage follower, Adder and Subtractor, Differentiator, Integrator, Amplifier, AC and DC Amplifier, Instrumentation amplifier, Active filters low pass, high pass and band pass, Voltage to Current converter Current to Voltage converter.

• Non-linear Applications

Comparators: Function of comparators, modes of operation of comparator, Open loop-zero crossing detector, Schmitt trigger, Threshold levels, Inverting and non-inverting. Hysteresis curve,

Converters: Voltage to Frequency Conversion, Frequency to Voltage Conversion, sample/Hold circuit, precision Rectifier. Oscillators: Wein Bridge Oscillator, Phase shift Oscillator, Relaxation Oscillator logarithmic amplifier and antilogarithmic amplifier, Basics of analog multiplier and dividers.

• Introduction to Microprocessor

How does microprocessor works, microprocessor architecture and its operation, introduction to Intel family of microprocessor, description of interfacing with address latches, Memory mapped 1/0 & 1/0 mapped 1/0.

• Assembly Language programming

How to write, assemble and execute a simple program, 8085 Programming Model, Instruction format-Assembler directive, addressing modes of 8085.

• Peripherals and Other Microprocessor

Peripherals: 8255 programmable peripheral interface, 8279 programmable key board interface, 8254/8253 programmable interval timer, 8259 programmable interrupt controllers, 8257 DMA controller, other microprocessors, Block Diagram, Addressing Modes, Resistors, Flag, Data and address, Structure of Z-80, MC, MC 6800, 8088/8086

Cathode Ray Oscilloscope

Introduction to CRO construction, Block Diagram of a general Purpose CRO, Cathode Ray Tube (CRT), Time Base Generator, Applications of CRO, Use of CRO to measure voltage, current, frequency, phase difference, Lissajou's Pattern, Special Purpose CRO: Dual Beam Oscilloscope, Dual Trace Oscilloscope, Digital Storage Oscilloscope.

• Modulation Techniques

Need of modulation, Analog Modulation, amplitude Modulation (AM): basics, modulation index, bandwidth and signal power, DSB, SSB and VSB, AM features and Drawbacks, Frequency Modulation (FM): basics. Modulation index, FM spectrum and Bandwidth, FM features, comparison with AM

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Pulse Modulation: Graphically explanations of pulse amplitude modulation (PAM) pulse width modulation (PWM), pulse position modulation (PPM)

Pulse Code Modulation (PCM): Sampling, Quantization and encoding, data rate for digital voice channel Digital Modulation Techniques: Graphically explanations of NRZ, RZ, Manchester, binary ASK, FSK, PSK, Quadrature Modulation

Product life cycle (PLC), Concept & benefits of PLC, Different stages in PLC, PC Architecture Computer operating Systems, Single-user, Multi-user, Basic concept of software and hardware.

REFERENCES

1. Integrated Electronic by Milkman Halkias

2. Art of Electronics by Horowitz Winfield Hill

3. Electronic Instrumentation and measurement techniques by Cooper

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SYLLABUS FOR METALLURGICAL ENGINEERING

- **FERROUS METALS**

a) Different types of furnaces such as medium frequency. High and normal frequency Induction furnaces & Electric Arc furnace.

b) VD and Electro Slag refining.

C) Cast Irons and their use. S.G. Iron.

d) Heat Treatment of Steel, Normalising. Annealing, Hardening & Tempering with reference to Iron-Carbon diagram.

e) Effect of alloying elements like C, Mn, Si, V, Cr, Ni, W, Mo.

f) Different types of steel like Structural, High Strength Steel, Ball Bearing, Non-Shrinking Steel, Hot Working Steel, High Speed Steel, Spring Steel, Case-Hardening Steel, Tool Steels, Die Steels.

g) Surface Treatment of Steel like Phosphating Galvanizing. Chromatising, Cadmium, Zine Plating, Anodizing

h) Testing of metal: Non-destructive testing like Ultra-sonic, X-ray, MPT, Tensiletesting, UTS, EL%, R of A%, Proof stress, Bend.

i) Different types of Hardness tests, Brinell, Vickers, Rockwell, shore.

j) Impact testing, Izode and Charpy.

k) Analysis of different types of elements like C, Mn, P, S, Si, Ni & Cr.

1) Metallographic examination and different types of etching reagents (Macro & Micro both).

m) Metal shaping: Hot working of metals like Forging, Rolling Extrusion, Cold Rolling, Wire Drawing and Deep Drawing, Press working sheet Metal working.

n) Foundry technology and different types of sands, Runner, Risers and their effect.

- **NON-FERROUS METALS**

a) Copper and its alloys: Melting, working and its heat treatment.

b) Aluminum and its Alloys its working and heat treatment.

C) Temperature and its measurement, Pyrometry.

d) Various types of Bearings metals, their use in industry.

e) Metal joining, Welding, Soldering and Brazing (TIG/MIG Welding).

f) Various types of defects in Casting, Forging. Extrusion Welding.

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SYLLABUS FOR CHEMICAL ENGINEERING

- **BASIC PRINCIPLES AND CONCEPTS IN CHEMISTRY**

Atoms, Molecules, Gas laws, Metals, Non-metals, Aliphatic and Aromatic compounds, Chemical Kinetics, Chemical thermo-dynamics, Surface chemistry, Instrumental methods of analysis.

- **INDUSTRIAL STOICHIOMETRY**

Mass, Volume relations in chemical reactions in chemical reactions, Molal units, vapor pressure, solubility and absorption, thermo-chemistry.

- **MECHANICS OF FLUIDS**

Flow of fluids in pipes and channels, viscosity of fluids, fluid heads, Transportation of fluids.

- **UNIT OPERATIONS**

Evaporation, Crystallization, Filtration, Distillation, Size reduction and Separation, Mixing and Conveying. Gas absorption and adsorption, Extraction, Drying, Heat Transfer, Mass transfer, Humidification and Air conditioning.

- **TYPICAL INDUSTRIES**

Iron and Steel, Fertilizers, Chlor-alkali: Water in industries.

- **EXPLOSIVES INDUSTRY**

Explosives, classification, propellants, solid and liquid propellants, pyrotechnics, basic concepts of ammunition, civil blasting explosives, safety in manufacture, handling, storage and transportation of explosives, statutory requirements and regulations, pollution control.

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SYLLABUS FOR CIVIL ENGINEERING

- **MATERIAL USED**

Cement, Bricks, Sands, Coarse aggregates, Fine aggregates, Glass, Stones, Timber, Steel, Fibers, Ceramics, Aluminum, Plastics, Paints, Distempers, Varnishes etc. Modern development of material for civil constructions. Construction Equipment, Hand tools, Concrete mixer, vibrators, Bitumen Handler, Road Rollers, Water Tankers, Pneumatic equipment etc..

- **CONSTRUCTION ENGINEERING**

a) Types of soils, bearing capacity of soils, improving bearing capacity of soil. Different types of foundations. General design principles, machine foundations, excavation of foundations setting out plan.

b) Stone Masonry,different types of brick masonry, types of bricks, classification of brick masonry.

c) Damp proofing &torrent proofing of buildings.

d) Scaffolding, shoring underpinning etc.

e) Lintels, classification of lintels.

f) Planning & design of stairs.

g) Plain concrete, material specification, water cement ratio, shrinkage, strength, transportation of concrete, setting time, slump, Joints in concrete guniting.

h) Reinforced Cement Concrete, Advantages, type of mixes, equivalent area of concrete columns, beams, slabs etc. Frame work for concrete.

i) Doors & Windows, Different types, types of timbers used, joints etc.

J) Ground floors, type of floors, acid proofing of floor etc.

k) Roofs, Classification of roofs, flat roofs, water proofing of roofs, drainage of flat & pitched roof.

1) Roof coverings, tiles, AC sheets, GI sheets, PVC sheets, Glass coverings, Bituminous felt.

m) Structural Steel works, rolled steel sections, Angles, Channels, I beams flat etc. steel trusses.

n) Fire protection of buildings, fire resisting material constructions etc.

o) Thermal insulation of Buildings, air, conditioning &ventilation, lightings, Acoustics & sound proofing etc.

p) Building planning, site selection, open air space requirements, wall thickness etc.

q) White washing, color washing, distempering, cement painting, paints, varnishes, brushes, types of paints and their applications. Preparation of surfaces etc.

r) Services in Building, Water supply requirement of Buildings, General pipe worns, Hydrants, Water meters, Drainage of house, Sanitary fittings, Rain water drainage. Traps, Septic tank etc.

- **WATER SUPPLY**

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a) Types of water sources, ground sources, underground sources etc.

b) Rate of Demand per capita requirements, requirements for different purposes.

c) Quality of water, analysis of water, physical, chemical, bacteriological test waterborne diseases.

d) Pumps, types of pumps used, centrifugal, turbine pumps, submergible pumps.

e) Design faction of water, chlorination of water, form of chlorination, tests etc.

f) General idea on water treatment plants, sedimentation, coagulations, filtration etc.

g) Conveyance & Distribution of water pipes, types, pipe corrosion, effects wastage of water, waste water survey etc.

h) Pipe Appurtenances, air valves, Sluice valves, bib-cocks, fire hydrants, non-return valve etc.

- **SANITARY ENGINEERING**

a) Sewage systems, storm water drains, quantity of sewage, construction of sewers, Sewer Appurtenances, flushing tanks, grease Boil traps, manholes.

b) Pumps for sewage, centrifugal pumps, non-clog pumps.

c) Quantity of sewage, properties, cycle of decomposition, analysis, physical, chemical, bacteriological tests requirement.

d) Safe disposal of sewages, methods of sewage treatments.

e) Pollution control requirements.

- **ESTIMATING COSTING & CONTRACTS**

a) Estimating quantities for elements of works.

b) Rates analysis, Requirement of manpower, Quantity per unit etc.

c) Administrative Approval, Technical Sanctions of works, Types of Tenders, Comparative statement, Specification of works, Condition of contract, Labour Law requirements.

d) Building Valuation, Market Rate/Book Value etc.

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SYLLABUS FOR CLOTHING TECHNOLOGY

- **INTRODUCTION TO TEXTILES**

a) Textile fibres, Definition, Essential characteristics, Classification, Physical and Chemical properties uses.

b) Woven, Knitted and non-woven stores, their salient features

c) Conversion of fibre into yarn, Lap and Silver preparation, conversion of silver into roving and then into yarn.

d) Conversion of yarn into fabric, Winding, Wrapping, Sizing and Draw in processes, Looms, primary, secondary, auxiliary operations of weaving.

- **CLOTHING**

a) Definition, Function and kinds, style and fashion, History of clothing industry.

b) Modern development in the field of clothing industry with a special reference to computerization.

c) Relation of anatomy of human in tailoring trade, Eight head theory, classification of human postures, Art of measurement, datum making, grading and their advantages. Layout system and their gain. Techniques of economical cutting and various tools/ machines used in the process, Marsden lay its preparation, Estimation of Labour, material and costing: Fabrication process of garment and inspection from bundling stage, stitches and seams; methods and machines used for stitching different types of clothes; special sewing machines. Technical terms used in tailoring trade.

- **INSPECTION**

Different methods of inspection and testing of fabrics and garments. Quality control measures and inspection methods of stage and finished product in workshop situation.

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SYLLABUS FOR LEATHER TECHNOLOGY

- **LEATHER PROCESSING**

(a) Anatomy of hides / skins, beam house operations, such as soaking, liming, deliming, bating. Knowledge of various types of defects and inspection of raw/hide skins.

(b) Veg Tanning: Pretanning use of syntans, tanning extracts, pyrogllol and catechol tanning, leach liquor, leaching, knowledge of process control of vegetable tanning.

(c) Chrome Tanning: Pretanning operations such as pickling, chrome tanning, basification, olation, oxolation, masking agents, neutralization, dying, viz. semichrome leather, chrome retannage.

(d) Finishing of leather: Knowledge of various types of finishing chemicals, such as pigments, binders, penetrators, etc. Preparations of different types of finishes of different uses.

(e) Knowledge of following operations: Fleshing, scudding, sammying, splitting, staking setting. drying by nailing or by taggle, vacuum drying, staking, buffing, embossing & measuring.

(f) Basic knowledge of various leather chemicals & auxiliaries used for leather processing.

(g) Basic knowledge of waste water effluent treatment generated from leather processing.

• LEATHER GOODS/FOOTWEAR/HARNESS & SADDLERY MFG.

(a) Selection and marking of upper and bottom leather for clicking of various types of components for boots/shoes/chappals, etc. Splitting of cut components and checking of guage, knowledge of skiving machine and skiving. Closing of boot/shoes uppers, selection, marking & rough cutting of various types of leather for leather goods / harness & saddlery manufacturing. Different types of tools and their use for hand operations for leather cutting.

(b) Eyeleting, insole tacking, pullovering M/c Lasting, hand lasting, tack removing, shank attaching, preparation & application to different parts. Middle sole leveling, sole attaching, sole stitching, delasting, screwing (M/c), edge trimming (M/C), heal attachment and finishing operation. Excess upper trimming, buffing, application of adhesive, attaching of wooden tips, vulcunising, excess rubber trimming, finishing of boots/shoes.

(c) Knowledge of following leather goods cutting and boot plant m/c, their auxiliaries attachments, tool setting where necessary, defect arising in operation and remedial measures.

(d) Upper stitching m/c, buffer press machine, knife cutter, machine circular, upper clicking machine, eyeleting machine, pull-over machine, lasting machine, heal-seat lasting machine, screwing machine, bottom clicking machine, levelling machine, edge trimming machine, heel scouring machine, buffing machine, vulcanising machine.

- **SADDLERY (INCLUDING CHAPPLES)**

(a) Tools and their uses: Stitching, rubbing, creasing and finishing, splicing straps and sewing billets, closing and punching, manufacture of light service equipments, saddlery items and chapples.

(b) Manufacture of saddlery for different categories of animal namely saddlery for horses, mules etc. Pack service equipment. Advanced work in saddlery: Different types of leather stores with metal

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fittings, leather tools for different types of buckets used, manufacture of simple saddlery items, blue print reading and their preparing for different operations on different components, completion and finishing of item taken in hand from start to finish.

(c) Handling and doing important operations on more difficult types of different service items during manufacture in saddlery shop.

(d) Knowledge of following saddlery shop, hand and powered machines, their auxiliary attachments, tool setting where necessary, defects arising in operation and remedial measures.

1. Buffer Press Machine

2. Splitting Machine

3. Circular knife cutting machine

4. Boot lace knife cutting machine

5. Straight edge cutting equipment

6. Double belt press machine

7. Hydraulic press for blocking of washers.

8. Belting Rolling machine

9. Press machines for washers and beltings

10. General Idea: Link cutting machine for link belting.

11. Splitting Machine.

12. Scabbord blocking

(e) Principal of leather selection and cutting. Economics of leather cutting, its utilisation and conversion etc. maintenance and repair of saddlery items, designing fancy leather goods. Manufacturing of designing and estimating of leather goods. Manufacturing of designing and estimating of fancy leather goods along with the knowledge of machine used.

(f) Knowledge of manufacturing of various types of washers. Handling of Blocking M/c. different types of flat and rounf belts, their manufacture and finishing etc

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SYLLABUS FOR MECHANICAL ENGINEERING (IT)

- **COMPUTER ORGANISATION**

Digital components, data representation, Register Transfer & Micro operations, Basic computer organization, central processing unit, ALU, Input-Output organization, Memory organization.

- **IT APPLICATION AND TOOLS**

Computer Organization, Operating System, Word Processing. Spread Sheet Package, Presentation Package.

◆BUSINESS SYSTEMS

Introduction to Business Data Processing, Concepts of Files, Principles and Technology of Programming. Introduction to Management Information System, Evolution of Information System, Decision Support Systems.

- **STRUCTURED SYSTEM ANALYSIS & DESIGN**

Introduction, System Analysis, System Development cycle, System Planning. Modular and Structured Design, System design and modeling. Input and Output specification, System implementation and maintenance, Computer system audit and security. Object Oriented analysis and design..

PROGRAMMING & PROBLEM SOLVING THROUGH, C-LANGUAGE

Introduction to programming. Algorithms for Problem solving, introduction to, C-Language, Data Types & enumerations, Conditionals and Loops, Arrays, Functions, Structures and Unions, Pointers, Self-referential structures and linked lists, File processing.

• DATA STRUCTURE THROUGH, C-LANGUAGE

Basic concepts of data representation, introduction to Algorithm design and data structure, Arrays, Stacks and Queues, Linked lists, Trees, Searching, Sorting and complexity, Graphs.

• INTRODUCTION TO DATA BASE MANAGEMENT SYSTEMS

Introduction to Data Base systems (DBMS), Database Architecture and Modeling. Entity Relationship Model, Relational Model, Data Base Normalization, introduction to SQL, Backup and Recovery, Data Base security and integrity, Design and Development of data applications on commercial RDBMS platforms.

• BASICS OF OS, UNIX & SHELL PROGRAMMING

Operating system concepts, file system, file attributes, vi editor, the shell as interpreter, process management, networking tools, filters and regular Expressions, Shell Programming. C programming Tools, UNIX internals, Administering file systems, general System Administration.

• DATA COMMUNICATION AND NETWORKS

Fundamentals of data communications, transmission media, data modems, multi-channel data communication, networking fundamentals, OSI model and TCP/IP suite, data link protocols, Local Area

Network (LAN), Wide Area Network (WAN), data transmission network, wireless communication, security and privacy.

- **INTERNET TECHNOLOGIES AND TOOLS**

Introduction to Internet and its applications, Internet Infrastructure, Internet Protocols, Internet working with TCP/IP, World Wide web, HTML.

• INTRODUCTION TO OBJECT ORIENTED PROGRAMMING & C++

Principles of Object oriented programming. Elements of C++ Language, Functions, Classes and objects, constructors and destructors, Operator Overloading, Derived classes and Inheritance, Pointers, Virtual Functions, Streams, Exception handling, class libraries, Advanced classes.

• INTRODUCTION TO OBJECT ORIENTED PROGRAMMING THROUGH JAVA

The Java Language, The Java Library.

COMPUTER GRAPHICS

Introduction and applications, Graphics Devices, 2D drawing Geometry, Conics and Curves, Graphic Operations, 3D graphics, Animation, Graphic Standards, Multimedia.

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पूरी किताब का नया संस्करण पाने के लिये संपर्क करें-

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